Total No. of Questions : 4]

SEAT No. :

P-1354

[Total No. of Pages : 3

[6058]-301
S.Y. B.C.A. (Science)
BCA - 231 : DATA STRUCTURES
(2019 Pattern) (Semester - III)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to right indicate full marks.***
3) ***Draw neat sketches whenever necessary to illustrate answer.***
4) ***Each question carry equal marks.***

Q1) A) Choose the correct option. **[5 × 1 = 5]**

a) _____ sorting algorithm can be used to sort a random linked list with minimum time complexity.

i) Insertion sort ii) Quick sort

iii) Heap sort iv) Merge sort

b) _____ many queues are required to implement a stack?

i) 3 ii) 2

iii) 1 iv) 4

c) A data structure in which elements can be inserted or deleted at / from both the ends but not in the middle is _____.

i) Queue ii) Circular Queue

iii) Priority Queue iv) Dequeue

d) Find no. of binary tree with 3 nodes which when traversed in post order gives the sequence A, B, C is _____.

i) 3 ii) 9

iii) 7 iv) 5

e) A vertex with degree one in a graph is called _____.

i) a leaf ii) pendant vertex

iii) adjacency list iv) node

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

a) Define Non-linear data structure.

b) List out 2 applications of linked list.

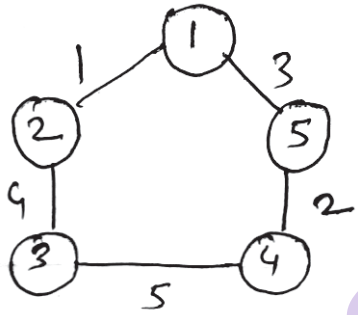
c) What is Pivot?

d) List out operations on Binary tree.

e) What is critical path?

Q2) Answer the following (Any Five) : **[5 × 3 = 15]**

a) Draw a Spanning tree of Graph G.



b) Define Binary tree and explain its advantages and disadvantages.

c) What is Recursion? Give one example.

d) Difference between singly linked list and doubly linked list.

e) Write a note on Multidimensional array.

f) What is Sparse Matrix? How it is represented using arrays?

Q3) Answer the following (Any Five) : **[5 × 4 = 20]**

a) Sort the following list using merge sort 2, 6, 8, 2, 3, 9, 1, 4, 9.

b) Write 'C' function for searching element in singly linked list.

c) What is Searching? Explain two techniques of it?

d) Write a 'C' function to insert node into Binary search tree.

e) What is Graph? Explain its types.

f) Explain representation of Queue with example.

g) Convert following expression infix to postfix form (Step - by - step) P/Q – R * S + T.

Q4) Answer the following (Any Five) : **[5 × 5 = 25]**

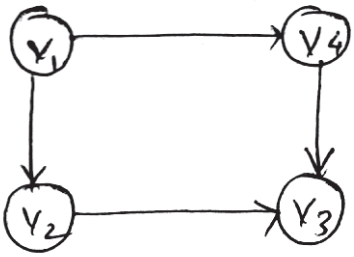
a) Construct a BST for following data.

11, 7, 15, 25, 18, 5, 12, 20

b) Define stack with its primitive operations.

c) Write 'C' function to delete node from beginning and end in Doubly linked list.

d) Construct adjacency matrix & adjacency list for given graph.



e) Write 'C' function to insert and delete element in Circular Queue.

f) What is tree? Explain methods of Tree traversal.

g) Write a short note on Asymptotic notations.

▽▽▽▽

Total No. of Questions : 4]

SEAT No. : ____

P1355

[Total No. of Pages : 4

[6058]-302
S.Y.B.C.A (Science)
BCA- 232 : DATABASE MANAGEMENT SYSTEMS-II
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***All quetions are compulsory***
2) ***Figures to the right indicates full marks.***
3) ***Draw lebeled diagram whenever necessary.***

Q1) Attempt the following. **[5×1=5]**

A) Choose the correct option

a) Record is a _____

i) Placeholder ii) Variable

iii) Datatype iv) Keyword

b) The execution sequences in concurrency control are termed as _____

i) Serial ii) Schedule

iii) Organization iv) Time tables

c) The default timestamp ordering protocol generates schedule that are ____

i) Recoverable ii) non-recoverable

iii) Starving iv) none of the mentioned

d) _____is alternative of log based recovery

i) disk recovery ii) shadow paging

iii) disk shadowing iv) crash recovery

e) The typical techique of discreationary access control in database system is based on the ____of previlege

i) Commit and Rollback ii) Granting & revoking

iii) Serial and non-serial iv) All the above

B) Answer the following **[5×1=5]**

a) What is view?

b) What is schedule?

c) What is Timestamp?

d) Enlist various types of errors

e) What is shared memory?

Q2) Answer the following (Any Five) **[5×3=15]**

a) What is Exception? How to handle exception in postgresal

b) Explain cascadeless schedule

c) State and explain Thomas write rule

d) Explain Log based recovery

e) Discuss the database security threats

f) Explain client/Server system architecture

Q3) Answer the following (Any Five) **[5×4=20]**

a) What is function? Explain with example

b) With suitable diagram explain different states of transaction

c) Following is the list of events in an interleaved execution of set T_1, T_2, T_3 and T4 assuming 2PL. IS there a deadlock? If yes which transactions are involved in a deadlock?

Time	Transaction	Code
t1	T1	Lock(A,X)
t2	T2	Lock (B,X)
t3	T3	Lock (A,S)
t4	T4	Lock (B,S)
t5	T1	Lock (B,S)
t6	T3	Lock (D,X)
t7	T2	Lock (D,S)
t8	T4	Lock (C,X)

d) Describe Differred update modification with example.

e) Explain various methods for database security in brief

f) Explain client / Server architecture

g) Consider the following transaction Give 2 non serial schedules that are serializable

T1	T2
Read (A)	Read (B)
A = A – 1000	B = B+100
Write (A)	Write (B)
Read (B)	Read (C)
B = B – 100	C = C +100
Write (B)	Write (C)

Q4) Attempt the following (Any five) **[5×5=25]**

a) Consider following database

student (Sno, Sname, Sclass, Saddr)

Teacher (tno, tname, qualification, experience) The relatioship of student and teacher is M-M with descriptive attribute as subject & Marks write a trigger before deleting a student record from the student table. Raise notice and display the message "Student record is being deleted"

b) Consider the following schedule and draw precedence graph for that state whether schedule is serializable or not.

T1	T2
Read (A)	
A = A– 50	
	Read (A)
	temp = A* 0.1
	A = A – temp
	Write (A)
	Read (B)
Write (A)	
Read (B)	
B = B +50	
Write (B)	
	B= B + temp
	write (B)

c) Explain variation of 2 phase locking protocol

d) What is checkpoint? How are they useful in crash recovery

e) Consider following database

Movie (mno, mname, relese-year, budget)

Actor (ano, aname, role, charges, addr)

Relationship between movie and Actor is M-M

Write a function to list moviewise charges of Amitabh Bachchan

f) Following are the log entries at the time of system crash

<T1, Start>

<T1, B, 100>

<T1, Commit>

<Checkpoint>

<T2, Start>

<T2, D, 100>

<T2, Commit>

<T3, Start>

<T3, D, 200>

<T3, B, 200> ← System Crush

If defferred update technique with checkpoint is used, what will be the recovery procedure?

g) What is deadlock? Explain Deadlock detection and prevention technique

Total No. of Questions : 4]

SEAT No. :

P-1356

[Total No. of Pages :3

[6058]-303
S.Y. B.C.A (Science)
BCA - 233 : COMPUTER NETWORKS
(2019 Pattern) (Semester - III)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat sketches whenever necessary to illustrate the answer.***

Q1) Answer the following. **[5 × 1 = 5]**

A) Choose the correct option

i) The length of an IP address is ____ bits.

a) 46 b) 64

c) 32 d) 16

ii) _____ type of noise is caused due to spikes.

a) Induced b) Crosstalk

c) Thermal d) Impulse

iii) In token passing method, each station has a predecessor and ____.

a) First b) End

c) Successor d) None of the above

iv) To compute checksum in IPv4, the value of the checksum field is set to _____.

a) 1 b) 2

c) 5 d) 0

v) SCTP is a _____ transport layer protocol.

a) reliable b) connectionless

c) connection-oriented d) both (a) and (b)

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

i) List the network layer services

ii) What are the two forms of signaling

iii) Define channelization

iv) What is dotted decimal notation?

v) List out different UDP operations

Q2) Attempt the following : (Any five) **[5 × 3 = 15]**

a) Write a short note on point-to-point network.

b) Explain three ports of IANA (Internet Assigned Numbers Authority).

c) Explain different transmission modes in detail.

d) List different types of CSMA protocol. Explain any one in details.

e) Explain any three types of extension headers.

f) Write short note on Domain Namespace.

Q3) Attempt the following : (Any five) **[5 × 4 = 20]**

a) Give the advantages of computer network.

b) Write functions of application layer.

c) Draw Graph for NRZ - L, NRZ - I for the following data-

i) 00000000 ii) 11111111

iii) 01010101 iv) 00110011

d) Write a short note on ERROR Detecting code.

e) Write IPv 4 limitations.

f) Differentiate between TCP and UDP.

g) Define :

i) Netid ii) Hostid

iii) Subnetting iv) Supernetting

Q4) Attempt the following : (Any five) **[5 × 5 = 25]**

a) Define Topology. Explain any two topology.

b) Explain TCP/IP protocol suit diagrammatically.

c) Explain line coding characteristics.

d) Given the dataword 1010011110 and the divisor 10111.

i) Show the generation of the codeword at the sender site (using binary division)

ii) Show the checking of the codeword at the receiver site (assume no error)

e) State the difference between IPv4 and IPv6.

f) Write uses of UDP.

g) Explain the features of TCP.

Total No. of Questions : 4]

SEAT No. :

P-1357

[Total No. of Pages : 4

[6058]-401

S.Y. B.C.A. (Science)

BCA 241 : OBJECT ORIENTED PROGRAMMING AND C++

(2019 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat diagram wherever necessary.***

Q1) A) Choose the correct option : **[5 × 1 = 5]**

i) Object Oriented Programming follows _____.

a) Top-down approach b) Bottom-up approach

c) Top-up approach d) Left-Right approach

ii) Only one copy of _____ data member is created for entire class.

a) Static b) Public

c) Private d) Inline

iii) Which is not the characteristics of constructor?

a) They should be declared in public section

b) They do not have return type

c) They cannot be inherited

d) They can be virtual

iv) The ambiguity in Single Level Inheritance is removed by using

a) Colon operator b) Scope Resolution operator

c) Comma d) New operator

v) Binary operators overloaded by means of member function requires _____explicit arguments.

a) One b) Two

c) Three d) None

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

i) List the different access specifier.
ii) What is Encapsulation?
iii) List the types of Inheritance.
iv) What is the purpose of fstream class?
v) What is the purpose of Scope Resolution Operator?

Q2) Answer the following (Any Five) : **[5 × 3 = 15]**

a) What is Inline function? Give its advantage and syntax.
b) What is Exception? Explain with example.
c) Write any 3 difference between Procedure Oriented Programming and Object Oriented Programming.
d) Write a C++ program to accept a number 'n', pass this number to the constructor and find sum of numbers from 1 to n.
e) Explain usage of this pointer with example.
f) Read the following code and answer

```
Class A
{
        int a, b;
        public :
    A ()
{
    a = 0;
    b = 0;
    }
    A (int x, int y)
{
    a = x;
    b = y;
}
    void display()
{
    cout << a << b << endl;
    }
};
    main ()
{
    A a;
    .....    Statement 1
    .....    Statement 2
}
```

i) How many number of Member function does the code contain.

ii) Write statement 1 to call Parameterized constructor.

iii) Write statement 2 to call display function.

Q3) Answer the following (Any five) : **[5 × 4 = 20]**

a) What is friend function? Discuss its characteristics.

b) Explain in short :

i) Abstract class

ii) Virtual function

c) Write a C++ program to read a text file and count number of Upper Case, Lower Case, Digits and Spaces.

d) Explain concept of Array of object with example.

e) What is constructor? Explain constructor overloading with example.

f) Write a C++ program to overload '+' operator to perform Addition of two complex Numbers.

g) Explain Multilevel Inheritance with example.

Q4) Answer the following (Any five) : **[5 × 5 = 25]**

a) Explain private inheritance with example.

b) Which are the two ways of defining Member function? Explain any one with example.

c) What is operator overloading? Write its syntax and also write the rules of operator overloading.

d) Discuss conversion of Basic to Class Type with example.

e) Write a C++ program to create a class shape with function to find area and display name of shape and other essential components of the class. Create derived class circle, square, rectangle each having overridden function area and display. Write a suitable program which illustrate virtual function.

f) Explain the following in short :

i) Object

ii) Class

iii) Reference variable

iv) Function overriding

v) New operator

g) Trace the output and justify

i)
```
# include ⟨iostream. h⟩
int z;
main ()
{
    int z = 50;
    cout << "value of z is" << : : z;
    cout << "value of z is" << z;
}
```

ii)
```
# include ⟨iostream. h⟩
Class A
{
    public :
            A ()
        {
            cout << "In class A";
        }
            ~ A ()
        {
            cout << "In Destructor";
        }
};
    Class B : public A
{
    public :
            B ()
        {
            cout << "In class B";
        }
            ~ B ()
        {
            cout << "In class B Destructor";
        }
};
            int main()
        {
            B b;
            return 0;
        }
```

Total No. of Questions : 4]

SEAT No. : ____

P1358

[Total No. of Pages : 3

[6058]-402

S.Y.B.C.A. (Science)

BCA-242 : WEB TECHNOLOGY

(2019Pattern) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagram must be drawn wherever necessary.***

Q1) A) Choose the correct options. **[5×1=5]**

a) The_____ function returns the column name

i) pg-field-name () ii) pg-col-name()

iii) postgres-field-name () iv) none of these

b) By default the index of array in PHP statrs from

i) 0 ii) 1

iii) –1 iv) 2

c) Which of the following operator when added before an expression ignores error messages?

i) @ ii) #

iii) % iv) ^

d) XML comments are written as _____

i) <!–!> ii) <!---?

iii) <?-?> iv) <$---%>

e) Which one of the following property scopes is not supported by PHP?

i) friendly ii) final

iii) public iv) static

P.T.O.

B) Answer the following : **[5×1=5]**

a) List types of XML parser.

b) For what purpose table Info () method is used?

c) State True/False PHP $–GET[] is super global array in PHP.

d) How static method is invoked?

e) What is the use of array-slice function?

Q2) Answer the following (any five) **[5×3=15]**

a) Explain how PHP works with web server.

b) Differentiate between anonymous function and normal function.

c) What is Introspection. Explain any two functions with example.

d) Explain SSL.

e) List the steps to write ajax code to retrieve. information from XML file using PHP.

f) Write a PHP program to display the total no. of rows returned by a query containing students studying in SYBCA class.

Q3) Answer the following (any five) **[5×4=20]**

a) Explain the following PEAR DB to get information about result object with example.

i) numrows ()

ii) numcols ()

b) Explain (Define) cookies. Give syntax for set cookie and explain the cookie attributes in detail with example.

c) What are the differences between AJAX and JAVA script.

d) Compare between for and for each loop.

e) Write a program in PHP to find the size of array using count and size of () function.

f) Explain what is HTTP authentication?

g) What are the placeholders in query? Explain in detail with example.

Q4) Answer the following: **[5×5=25]**

a) Explain self processing pages concepts in detail with example.

b) Explain Encapsulation with its advantages .

c) Consider tables: Plant (Plant-id, plant-name, plant-type, price)

Write a PHP script to accept-plant-type. The script schould display the information of plants belonging to the plant-type entered by user.

d) Create an application that reads Book. XML file into simple XML object. Display attributes and elements (Hint : use simple-XML-load-file())

e) Explain the following array function, with example.

i) arr-pad ( )

ii) array-values ( )

iii) range ( )

f) What is Sticky form? Explain with example.

g) Explain prepare and excecute functions with suitable example.

Total No. of Questions : 4]

SEAT No. :

P-1359

[Total No. of Pages : 4

[6058]-403

S.Y. B.C.A.

BCA-243: SOFTWARE ENGINEERING

(2019 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Figures to the right indicate full marks.***
2) ***Draw neat diagrams wherever necessary.***
3) ***All questions are compulsory.***

Q1) Attempt the following :

A) Choose the correct option : **[5 × 1 = 5]**

a) Which of the following is not the element of the system?

i) Control

ii) Input

iii) Environment

iv) Risk

b) Which is the characteristics of software process?

i) Understanding ii) Visibility

iii) Reliability iv) All of the above

c) SDLC stands for _____.

i) System Development Life Cycle

ii) System Development Life Control

iii) Software Development Life Cycle

iv) System Design Layout Cycle

P.T.O.

d) _____ is the final work product produced by the requirement engineer.

i) Negotiation

ii) Elicitation

iii) Specification

iv) Inception

e) Agile modeling provides guidance to practitioner during which of the following software task?

i) Analysis

ii) Coding

iii) Design

iv) Both i) and iii)

B) Answer the following : **[5 × 1 = 5]**

a) What is closed system.

b) Define Software engineering

c) List the activities in SDLC.

d) What is negotiation?

e) What is pseudocode?

Q2) Answer the following (Any 5) : **[5 × 3 = 15]**

a) Write a note on DSS.

b) Explain umbrella activities.

c) What are the characteristics of Software? Explain.

d) Explain any three validation phases of V and V model.

e) Explain Adaptive Software Development Model.

f) What is the need of software.

Q3) Answer the following (Any 5) : **[5 × 4 = 20]**

a) What is requirement? Explain its types.

b) Explain steps in prototyping model.

c) What is the difference between structured and unstructured interview.

d) Explain output design with example.

e) What is open system? Explain.

f) Explain two advantages and two disadvantages of DFD.

g) What is feasibility study? Explain its types.

Q4) Answer the following (Any 5) : **[5 × 5 = 25]**

a) Draw Decision Table for the following :

An organization decides to give Diwali Bonus to all the employees. For this the management has divided the employees into three categories namely Administrative staff (AS), Office staff (OS), Workers (W) and consider the rules given below :

i) If the employee is permanent and in the 'AS' category, the bonus amount is three months salary.

ii) If employee is permanent and in 'OS' category, bonus amount is two months salary.

iii) If employee is permanent and in 'W' category, the bonus amount is one month.

iv) If employee is temporary, then half of the amount is given to them as per the permanent employee's bonus amount.

b) Draw context level and 1st level DFD for Hospital Management System.

c) Explain five components of system.

d) Explain different fact finding techniques.

e) Explain process framework activities.

f) What is requirement gathering? Explain.

g) Differentiate between Physical DFD and Logical DFD.

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Total No. of Questions : 4]

SEAT No. :

P1360

[Total No. of Pages : 3

[6058]-501
T.Y.B.C.A. (Science)
BCA 351 - DSEI : PROGRAMMING IN JAVA
(2019 Pattern) (Semester - V)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Figures to the right indicates full marks.***
2) ***Draw lebeled diagram whenever necessary.***

Q1) Attempt the following. **[5×1=5]**

A) Choose the correct options

a) _____of these operators is used to allocate memory for an object.

i) alloc ii) new

iii) give iv) malloc

b) _____is a collection of classes and inter Faces

i) Package ii) Object

iii) Method iv) Inheritance

c) _____of this interface is not a part of java's collection Framework

i) Set ii) List

iii) Sorted List iv) Sorted Map

d) _____is base class for all swing UI components

i) Jmenu ii) Jcomponent

iii) Jpanel iv) Jformat

e) _____method is used to perform DML statments in JDBC

i) execute () ii) executeQuery ()

iii) executeUpdate () iv) executeResult ()

P.T.O.

B) Attempt the following. **[5×1=5]**

a) Why Java is called portable?

b) What is super class?

c) Short note on collection inter Face

d) List types of layout managers

e) Define Resultset

Q2) Answer the following: (any five) **[5×3=15]**

a) Explain static Fields and methods.

b) Explain Final keyword with suitable examples.

c) Write a note on exception handing.

d) Explain keyboard events with the help of Program.

e) Differentiate between connection and statements.

f) Explain session trackin in details.

Q3) Answer the following: (any five) **[5×4=20]**

a) What is servlet? Explain the types of servlet in detail.

b) Explain types of JDBC in detail

c) Write a Java program display menu using JPopMenu.

d) Write a Java program to create abstract class student derived two classes marks and result From it use proper method to accept and display for the same.

e) Explain various types of access modifiers in detail.

f) Differentiate between checked and unchecked exception.

g) Explain JSP directives in detail.

Q4) Answer the following: (any five) **[5×5=25]**

a) What is constructor? Explain types of constructor in details.

b) What is inheritance? Explain any two types of inheritance with suitable example

c) Explain any four methods of string class with the help of an example

d) Create table of Teacher with fields (Tid, Tname, Taddress) write a JDBC Program to insert the details and display all teacher details

e) Write a servlet program which counts how many times a user has visited a web page (use session)

f) How to create interface? Explain with example

g) Write a Java program to accept in numbers in vector and display all statements sum.

Total No. of Questions : 4]

SEAT No. :

P-1361

[Total No. of Pages :3

[6058]-502
T.Y. B.C.A (Science)
BCA - 352 : DSE - II : DATA MINING AND DATA SCIENCE
(2019 Pattern) (Semester - V)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat sketches whenever necessary to illustrate the answer.***

Q1) Answer the following. **[5 × 1 = 5]**

A) Choose the correct option

i) _____ is the process of removing noise and inconsistent data.

a) Data cleaning b) Data transformation

c) Data integration d) Data Reduction

ii) _____ describes the data contained in the data ware house.

a) Relational data b) Operational data

c) Metadata d) Informational data

iii) SVM (support vector machine) can be used for ____

a) Classification only

b) Regression only

c) Classification & regression both

d) Feature extraction only

iv) Which statement is true about k-means algorithm.

a) The output attribute must be categorial

b) Attribute values may be either categorial or numeric

c) All attribute values must be categorial

d) All attribute values must be numeric

v) Which of the following is the key data - science skills.

a) Statistics b) Machine learning

c) Data visualization d) All of above

B) Attempt the following **[5 × 1 = 5]**

i) What is the purpose of Z-test?

ii) Define star - schema

iii) List any two disadvantages of decision tree

iv) What is the time complexity of apriori algorithm

v) Which is the best visualization tool?

Q2) Answer the following : (Any five) **[5 × 3 = 15]**

a) What is data cleaning? Discuss the methods of data cleaning.

b) What is regression? What are its types?

c) Discuss the different applications of clustering.

d) Explain advantages and disadvantages of EDA.

e) Explain the process of data science with diagram.

f) Explain the different types of data.

Q3) Attempt the following : (Any five) **[5 × 4 = 20]**

a) Discuss the major issues in data mining.

b) Differentiate between star schema and snow flakes schema.

c) Write a note on SVM classifier

d) Explain k-medoid algorithm in brief.

e) What is feature engineering? What are its steps?

f) Describe Bayesian classification.

g) Explain the concept of Hierarchy generation.

Q4) Answer the following : (Any five) **[5 × 5 = 25]**

a) What is Exploratory Data Analysis? How it is different from IDA?

b) Discuss the different types of association rules.

c) Explain the basic decision tree induction algorithm.

d) Describe the features of data warehouse.

e) Explain the various steps in data pre-processing.

f) What is Data-mart? Explain its applications.

g) What is data - descretization? Explain with suitable example.

Total No. of Questions : 4]

SEAT No. :

P-1362

[Total No. of Pages : 3

[6058]-503
T.Y. B.C.A (Science)
BCA - 353 : DSE-III : PRINCIPLES OF OPERATING SYSTEMS
(2019 Pattern) (Semester - V)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw labeled diagram wherever necessary.***

Q1) **Attempt the following:** **[5 × 1 = 5]**

A) **Choose the correct option:**

i) In a bit vector each block is represented by _____ if block is free and ___ if block is allocated.

a) 1,0 b) 0,1

c) 0,0 d) 1,1

ii) The host controller is _____.

a) Controller built at the end of each disk

b) Controller at the computer end of the bus

c) Controller built at the start of each disk

d) None of the mentioned

iii) The percentage of time that a particular page number is found in the TLB is called _____.

a) dot ratio b) merit ratio

c) hit ratio d) none of the above

iv) Which of the following is not necessary condition in deadlock?

a) Mutual Exclusion b) Safe State

c) Circular Wait d) Hold and Wait

v) Semaphores are mostly used to implement :

a) IPC mechanisms b) System calls

c) System protection d) None of the above

P.T.O.

B) **Attempt the following:** **[5 × 1 = 5]**

i) Define process.

ii) What is the request edge?

iii) What is compaction?

iv) Enlist attributes of files.

v) Define seek time.

Q2) **Answer the following (Any five):** **[5 × 3 = 15]**

a) Write a short note on process termination.

b) Explain overlays.

c) Discuss the requirements of the critical problem solution.

d) State the necessary conditions for deadlock to occur.

e) Write a short note on C-look scheduling.

f) List advantages and disadvantages of indexed allocation.

Q3) **Answer the following (Any five):** **[5 × 4 = 20]**

a) Explain tree - structure directory structure.

b) Suppose the disk drives has 200 cylinders, numbered from 0 to 199. The current head position is 53, the queue of pending requests is : 98,183,41,122,14,124,65,67. The FCFS scheduling algorithm is used. How many total head movement (in number of cylinders) incurred while servicing these requests?

c) Write a short note on preemptive scheduling.

d) State the advantages and disadvantages of dynamic linking.

e) Consider the following set of process with CPU burst time given in milliseconds.

Process	Burst time	Arrival time
P_1	5	1
P_2	3	0
P_3	2	2
P_4	4	3
P_5	8	2

Illustrate the execution of these process using preemptive SJF. Calculate average turnaround time and average waiting time.

f) Explain deadlock recovery in detail.

g) Explain the producer - consumer problem.

Q4) **Answer the following (Any five):** **[5 × 5 = 25]**

a) Explain linked Allocation Method.

b) Consider the following page reference string :

8,0,1,2,0,3,0,4,2,3,0,3,2,1,2

How many page faults would occur for the following page replacement algorithms. Assuming three frames?

All frames are initially empty.

i) Optimal page replacement

ii) LRU replacement

c) Consider given snapshot of system. A system has 5 processes and 3 types of resources A,B,C.

	Allocation		
	A	B	C
P_0	0	1	0
P_1	2	0	0
P_2	3	0	2
P_3	2	1	1
P_4	0	0	2

Max		
A	B	C
7	5	3
3	2	2
9	0	2
2	2	2
4	3	3

Available		
A	B	C
3	3	2

Answer the following question using Banker's Algorithm :

i) What is the contents of matrix need?

ii) Is the system in safe state?

d) Explain Message Passing Systems.

e) Write short note on segmentation.

f) Describe the disk management in OS.

g) Differentiate between deadlock and starvation.

Total No. of Questions: 5]

SEAT No. : ____

P1363

[Total No. of Pages :2

[6058]-504
T.Y. B.C.A. (Science)
BCA - 354, SEC- I : ARTIFICIAL INTELLIGENCE
(2019 Pattern) (Semester-V)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw labeled diagram wherver necessary.***

Q1) Attempt any Eight of the following. **[8×1=8]**

a) What are the features of good control strategies.

b) What is an Agent?

c) What is Machine Learning?

d) What is Semantic Network?

e) What is Proposition?

f) What is Fact and Knowledge?

g) What is Supervised Learning.

h) List any four Primitives of CD (Conceptual Dependency).

i) Write a short note on Data Shaping.

j) Represent the following using semantic nets. Ravi is taller than Amol.

Q2) Attempt any Four of the following. **[4×2=8]**

a) State any two approaches to knowledge representation.

b) What are the advantages of breath first search.

c) Write a short note on production System.

d) List the applications of Clustering in different fields.

e) Write a short note on Frames.

P.T.O.

Q3) Attempt any two of the following. **[2×4=8]**

a) Explain the disadvantages of Hill climbing and solutions for them.

b) Write State Space representation of "Water Jug Problem". There are 2 jugs of 4 L and 3 L respectively we want 2 L water in 4L jug.

c) Explain Reinforcement Learning.

Q4) Attempt any Two of the following. **[2×4=8]**

a) Consider following axioms in clause form.

i) Man (marcus)

ii) Pompeian (marcus)

iii) ¬ pompeian (x_1) v Roman (x_1)

iv) ruler (caesar)

v) ¬ Roman (x_2) V loyalto (x_2, caesar) V hate (x_2, caesar)

vi) Loyalto (x_3, f_1 (x_3))

vii) ¬ man (x_4) V¬ ruler (y,) v¬ tryassassinate (x_4,y_1) V¬ loyalto (x_4, y_1)

viii) Tryassassinate (Marcus, caesar) using Resolution algorithm prove hate (marus, caesar)

b) Write Restaurant Script.

c) Explain any 4 characteristics of problem (Problem characteristics)

Q5) Attempt any one of the following. **[1×3=3]**

a) Convert the following Sentences in to first order logic

i) All students are smart

ii) There exists a student

iii) Every student loves some student

b) Explain means ends analysis algorithm with example.

Total No. of Questions : 5]

SEAT No. :

P1364

[Total No. of Pages : 2

[6058] - 505

T.Y.B.C.A.

BCA - 355,SEC - II : CLOUD COMPUTING

(2019 Pattern) (Semester - V)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***

2) ***Draw labeled diagram wherever necessary.***

Q1) Attempt any EIGHT of the following. (out of TEN) **[8×1=8]**

a) Public cloud means what?

b) Which cloud platform is provided by Amazon?

c) Hypervisor is also known as?

d) What is load balancing?

e) Define Google File System (GFS).

f) S3 stands for ____?

g) What is cloud migration?

h) What is Multi - cloud?

i) Define the term CSA?

j) SLA stands for ___?

Q2) Attempt any FOUR out of the following. (out of FIVE) **[4×2=8]**

a) What is the difference between Cloud computing & Grid computing?

b) Write a note on Amazon Quantum ledger Database.

c) What are the challenges while using multi - cloud environment?

d) What are the benefits of containerization?

e) Define the term saas cloud computing security architecture?

P.T.O.

Q3) Attempt any TWO of the following. (out of THREE) **[2×4=8]**

a) What are the advantages & disadvantages of Iaas?

b) Explain any Four types of virtualization.

c) Which services are provided by Force.com?

Q4) Attempt any TWO of the following. (out of THREE) **[2×4=8]**

a) What are the features of Grid Computing?

b) List & define the services offered by Microsoft Azure.

c) What is security governance? Explain its key objective.

Q5) Attempt any ONE of the following. (out of TWO) **[1×3=3]**

a) Explain various types of Block Chain Technology?

b) Explain seven step model of migration process?

Total No. of Questions : 4]

SEAT No. : ____

P1365

[Total No. of Pages : 3

[6058]-601
T.Y.B.C.A. (SCIENCE)
DSE-IV : ANDROID PROGRAMMING
(2019 Pattern) (Semester - VI) (BCA361)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Figures to the right indicates full marks.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt of the following. **[5×1=5]**

A) Choose the correct options:

a) _____are small activities that can be added or removed from activity.

i) Action Bar ii) Intent
iii) Fragment iv) Views

b) _____show items in a center-locked, horizontal scrolling list.

i) Gallery ii) Image view
iii) Image iv) Image switcher

c) _____is a method of sQlite Database

i) rawQuery ( ) ii) on Create ( )
iii) on Upgrade ( ) iv) get Writable Database ( )

d) _____groups view in rows and columns.

i) Linear ii) Absolute
iii) Relative iv) Table

e) _____is the process of Finding the geographic coordinates of given address or location.

i) Reverse Geocoding ii) Geocoding
iii) Only (i) iv) Both (i) & (ii)

B) Answer the following: **[5×1=5]**

a) Explain use of Datepicker.
b) Enlist the types of Menu.
c) Define AVD.
d) What is tragment?
e) What is viewGroup?

P.T.O.

Q2) Answer the following: (any five) **[5×3=15]**

a) Explain different kinds of Layout?

b) Write the use of oncreate () onUpgrade () and get writable Database () methods.

c) Write an application to send Email using Intent.

d) List and explain methods of SQlite open Helper.

e) What is Fragments? Explain types of it.

f) List and explain Image views.

Q3) Answer the following: (any five) **[5×4=20]**

a) What is Basic views and explain any three with example?

b) Explain life cycle of Activity?

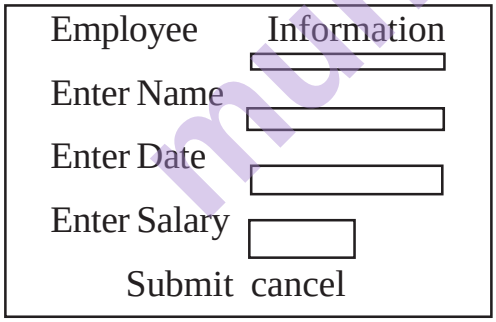
c) Explain Features of Android.

d) What is Menu? Explain types of Menu.

e) What is picker view? Explain it with example.

f) Write steps for Linking activities using intents.

g) Write an application for the following layout:



Q4) Answer the following: (Any five) **[5×5=25]**

a) Differentiate between.

i) Location based services and Google map

ii) Geocoding and Reverse Geocoding

b) Write an android application to display dial pad using Intent.

c) Define:
   i) Progress Bar
   ii) Toast
   iii) Textview
   iv) Table layout
   v) Linear Layout

d) Explain List view using Adapter class with example.

e) Explain Layouts with example.

f) Write an Android Application to calculate factorial.

g) How to create database in sQlite? Give an example.

Total No. of Questions : 4]

SEAT No. :

P-1366

[Total No. of Pages : 3

[6058]-602

T.Y. B.C.A. (Science)

DSE-VI (BCA-362) : PROGRAMMING IN GO

(2019 Pattern) (Semester - VI)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Figures to the right indicate full marks.***
2) ***Draw diagram wherever necessary.***

Q1) A) Attempt the following : **[5 × 1 = 5]**

i) A _____ group provides a Goroutine synochronization mechanism in Golang.

a) wait b) subroutine

c) watch d) no

ii) _____ can be defined inline without the need for a name.

a) Array b) Package

c) Class d) Anonymous functions

iii) An interface type that specifies _____ methods is known as empty interface.

a) zero b) positive

c) negative d) five

iv) A Go function can return _____ values.

a) Single b) Negative

c) Positive d) Multiple

v) In Golang, which of the following transfers control to the labelled statement?

a) enum b) goto

c) jump d) return

P.T.O.

B) Attempt the following : **[5 × 1 = 5]**

i) What is workspace?

ii) What are timers?

iii) Who designed Go Language?

iv) What is the first line in Go Language program?

v) When compiler will throw unused import error message?

Q2) Attempt the following (Any Five) : **[5 × 3 = 15]**

a) How to define multiple variables in Go? Explain with suitable example.

b) What is the need of blank identifier?

c) How to find out slice length and capacity?

d) How methods are different from functions?

e) Explain buffered channel.

f) What are import paths?

Q3) Answer the following (Any five) : **[5 × 4 = 20]**

a) Write a program to create empty file in Go.

b) Write a program in Go Language to create a simple buffered channel of string with capacity of one.

c) Can method accept both pointer & value? Explain.

d) How to copy elements of one slice into another slice?

e) What are formal and actual parameters in function?

f) Explain for loop with its syntax.

g) Write a note on Type assertion and type switches.

Q4) Answer the following (Any five) : **[5 × 5 = 25]**

a) Explain call by reference concept with example.

b) Explain multidimensional arrays in Go.

c) Explain methods with non-struct type receiver.

d) What are table tests?

e) Write a program in Go Language to print fibonacci series of interms.

f) Write a program using pointer to print addition of two numbers in go.

g) What is bufio package?

□□□

Total No. of Questions : 4]

SEAT No. : ____

P1367

[Total No. of Pages : 2

[6058]-603

T.Y.B.C.A (Science)

DSE-VI : SOFTWARE PROJECT MANAGEMENT

(2019 Pattern) (Semester-VI) (BCA 363)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Figures to the right indicate full makrs.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt the following: **[5×1=5]**

A) Choose correct option.

a) _____ process uses up most of the budget in project.

i) Executing ii) Integrating

iii) Monitoring iv) Planning

b) The particular task performance in CPM known as _____.

i) Event ii) Dummy

iii) Contract iv) Activity

c) The scrum methodology is based on _____ process.

i) Continuous ii) Empirical

iii) predictive iv) Parallel

d) A project usually has a time line chart which developed by_____.

i) Berry Boehm ii) Henry Gantt

iii) Ivar Jacabson iv) Ali Amacon

B) Attempt the following: **[5×1=5]**

a) Define the term ability test.

b) What is sprint?

c) Define timeline.

d) What is an activity?

e) What is time band?

P.T.O.

Q2) Attempt the following: (any five) **[5×3=15]**

a) Differentiate between project and flow type work.

b) Write a note on network diagram.

c) Write a note on critical path method.

d) Explain change control in detail.

e) Explain project scheduling in an agile environment.

f) What is communication process in project management?

Q3) Attempt the following : (Any five) **[5×4=20]**

a) Explain how to manage people? How to select staff?

b) Differentiate between predictive process and empirical process.

c) How to manage the contract in project management?

d) Discuss the importance of activity scheduling

e) Explain the objectives of activity planning.

f) Write a note on build or buy decision.

g) Explain types of dependency in detail.

Q4) Attempt the following : (Any five) **[5×5=25]**

a) Explain forward and backward pass techniques in detail.

b) Explain WBS and its types in detail.

c) What is PERT? Explain with an example.

d) Explain SCM in detail.

e) Explain Roles and responsibility in anagile team.

f) Explain the oldham, Hack man job characteristic model with an example.

g) What is meant by stress, health and safety in software project management?

Total No. of Questions : 5]

SEAT No. :

P1368

[Total No. of Pages : 3

[6058]-604

T.Y. B.C.A. (Semester - VI)

BCA 364 : SEC - III : Management Information Systems

(2019 Pattern)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw diagrams wherever necessary.***

Q1) Attempt any eight of the following : **[8×1=8]**

a) The flow of information through MIS is _____.

i) need dependent ii) organization dependent

iii) information dependent iv) management dependent

b) MIS normally found in a manufacturing organization will not be suitable in the _____.

i) Service sector ii) Banking sector

iii) Agriculture sector iv) Education sector

c) The backbone of any organization is

i) management ii) employee

iii) capital iv) information

P.T.O.

d)  symbol in VSM stands for

i) Safety stock ii) Storage

iii) Warehouse iv) Truck

e) ERP, EDI, AMS, DMS, CMS are components of _____.

i) MIS ii) EMS

iii) CRM iv) GDSS

f) How many key elements of supply chain are there?

i) One ii) Two

iii) Three iv) Five

g) _____ type of knowledge resides in human brain.

i) Tacit ii) Programmable

iii) Explicit iv) Non programmable

h) How many phases of decision making process exists?

i) One ii) Three

iii) Two iv) Four

i) How many phases of CRM exists?

i) Two ii) One

iii) Three iv) Four

j) _____ consists of conversion of Tacit to tacit type of knowledge.

i) Socialization ii) Externalization

iii) Combination iv) Internalization

Q2) Attempt any four of the following : **[4×2=8]**

a) Write any two advantages of DSS.

b) What is e-CRM?

c) What is knowledge bottleneck problem?

d) State any two objectives of financial management.

e) Write any two ways how business processes are made powerful with use of Information technologies.

Q3) Attempt any two of the following : **[2×4=8]**

a) What are various types of MIS?

b) What are various phases of decision making process?

c) What are three phases of CRM?

Q4) Attempt any two of the following : **[2×4=8]**

a) What are different modules of ERP?

b) Explain various components of DSS.

c) Explain service process cycle with neat diagram.

Q5) Attempt any one of the following : **[1×3=3]**

a) Write a short note on methods of data and information collection.

b) Write a short note on phases of business process Re-engineering.

Total No. of Questions : 5]

SEAT No. :

P-1369

[Total No. of Pages : 4

[6058]-605

T.Y. B.C.A. (Science)

SEC-IV: INTERNET OF THINGS (IoT)

(BCA 365) (2019 Pattern) (Semester - VI)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates :

1) ***Figures to the right indicate full marks.***
2) ***Draw neat diagrams wherever necessary.***
3) ***All questions are compulsory.***

Q1) Attempt any Eight of the following (out of Ten) : **[8 × 1 = 8]**

a) _____ of the following is the way in which IoT device associated with data.

i) Cloud ii) Internet

iii) Network iv) Automata

b) An embedded system communicate _____ with outside world.

i) Memory ii) Output

iii) Input iv) Peripherals.

c) _____ of the IoT networks has very short range.

i) Short Network

ii) LPWAN

iii) SigFox

iv) Short-range Wireless Network.

P.T.O.

d) WSN stands for _____.

i) Wireless sensor node

ii) Wired sensor node

iii) Wireless sensor network

iv) Wired sensor network

e) _____ role of the cloud in smart grid architecture.

i) Collect data

ii) Manage data

iii) Security

iv) Store data

f) An IoT network is a collection of _____ devices.

i) Machine to Machine

ii) Signal

iii) Inter connected

iv) Network to Network

g) _____ one of the following protocol is lightweight.

i) IP

ii) HTTP

iii) MQTT

iv) COAP

h) _____ many numbers of the element in the open IoT architecture.

i) Four elements

ii) Five elements

iii) Six elements

iv) Seven elements

i) _____ of the following is not an IoT device.

i) Table

ii) Artwins

iii) Tablet

iv) Laptop

j) _____ of the following is not a sensor in IoT.

i) BMP280

ii) DHT1

iii) Photoresistor

iv) LED

Q2) Attempt Any Four of the following (out of Five) : **[4 × 2 = 8]**

a) Explain characteristic of Embedded system.

b) Differentiate between IoT Devices and computers.

c) What is Sensor Networks?

d) Explain threat modeling in detail.

e) Describe RFID protocol in detail.

Q3) Attempt Any Two of the following (out of three) : **[2 × 4 = 8]**

a) Explain any two IP based protocol in detail.

b) List out pillars of IoT. Explain any two of them.

c) Explain Amazon Web Services.

Q4) Attempt Any Two of the following (out of three) : **[2 × 4 = 8]**

a) Explain Security Model of IoT.

b) What are the Networking components?

c) Explain components of Embedded system.

Q5) Attempt Any One of the following (out of two) : **[1 × 3 = 3]**

a) Explain IoT Communication Model in detail.

b) Differentiate between M2M and WSN protocol.

✷ ✷ ✷